MA/CSSE 473 – Design and Analysis of Algorithms **In-class Quiz Day 07**

Name:_____ Score:____/ 9 circle your Section # 01(3rd) 02 (4th)

1. Prove that there is always a survivor in an odd pie fight.

2. When exponentiating n-bit numbers $x^y \pmod N$, where N is also n-bit, how many recursive calls are needed?

3. Each call is $\Theta(\quad)$

4. Entire exponentiation algorithm is $\Theta(\quad)$

5. Show the recursive calls for Euclid's Algorithm applied to a=188 and b=144.

6. The following two conditions imply that d = gcd(a,b):

   a.

   b.

7. Prove the validity of the extended Euclid algorithm.

```
def euclidExtended(a, b):
    """ INPUT:  Two integers a and b with a >= b >= 0
        OUTPUT: Integers x, y, d such that d = gcd(a, b)
                and d = ax + by"""
    print ("    ", a, b) # so we can see the process.
    if b == 0:
        return 1, 0, a
    x, y, d =  euclidExtended(b, a % b)
    return y, x - a//b*y, d
```

8. What became clear to you as a result of today's discussion? (or write N/A)

9. Is there anything from today's discussion that was unclear, do you have questions, or is there anything else you want to tell me? (or write N/A)